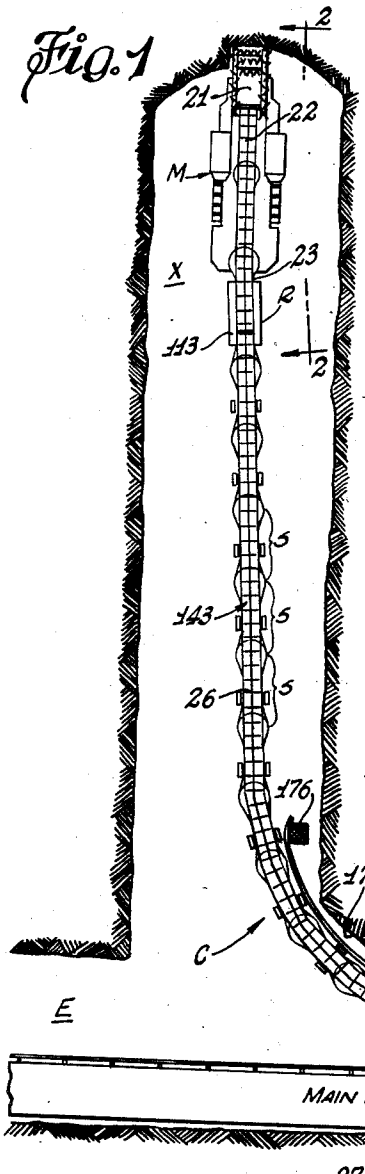
April 6, 1954 F. CARTLIDGE 2,674,364

PORTABLE CONVEYING APPARATUS

Filed Dec. 30, 1950

6 Sheets-Sheet 1

Fig. 1



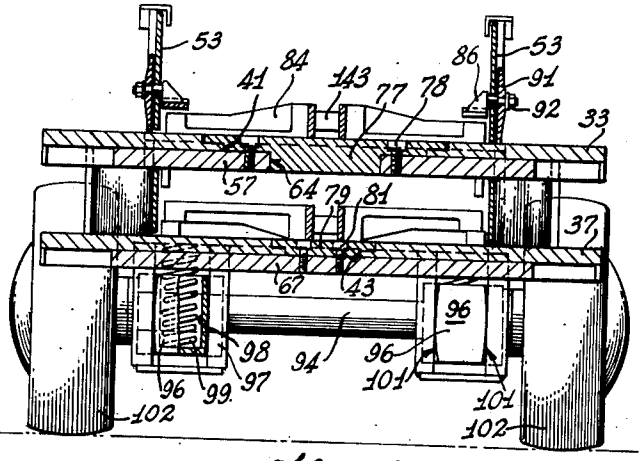
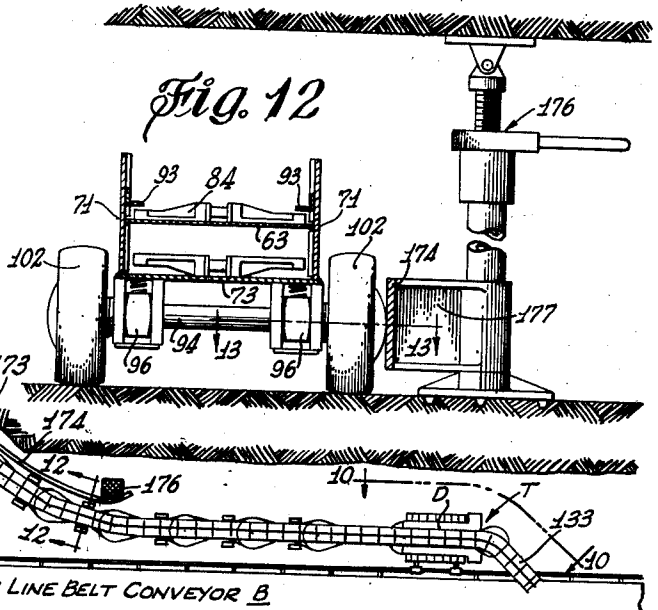


Fig. 11

Fig. 12



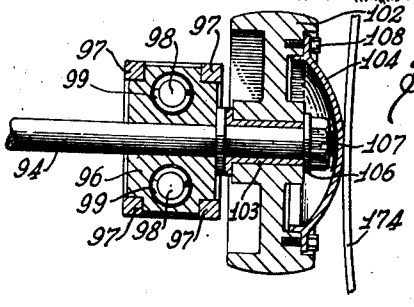


Fig. 13

INVENTOR.
Frank Cartlidge
BY
Murray A. Gleeson
ATTORNEY

April 6, 1954 F. CARTLIDGE 2,674,364

PORTABLE CONVEYING APPARATUS

Filed Dec. 30, 1950

6 Sheets-Sheet 2

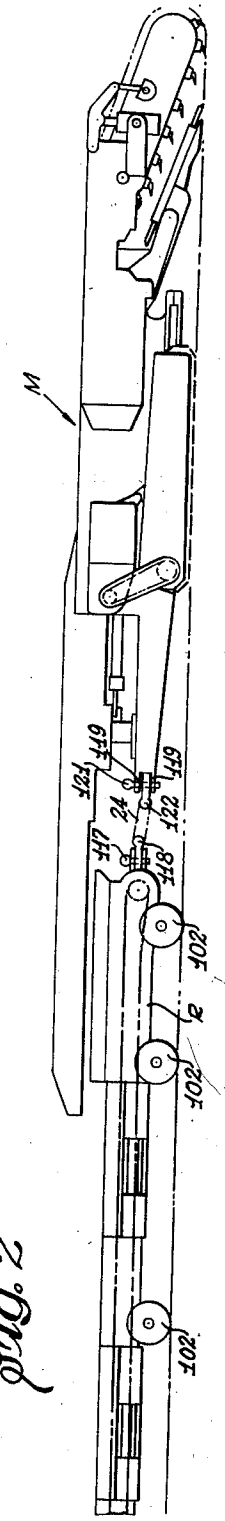


Fig. 2

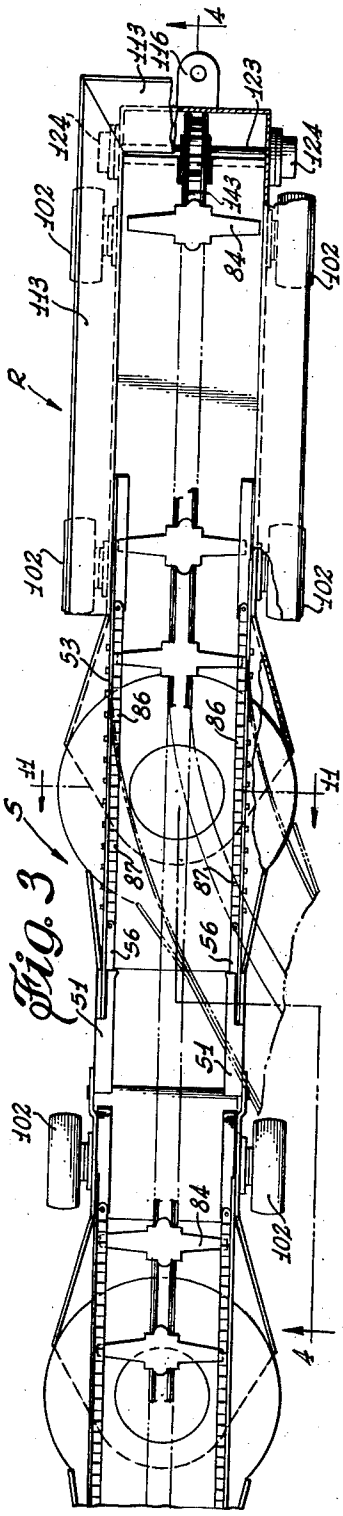


Fig. 3

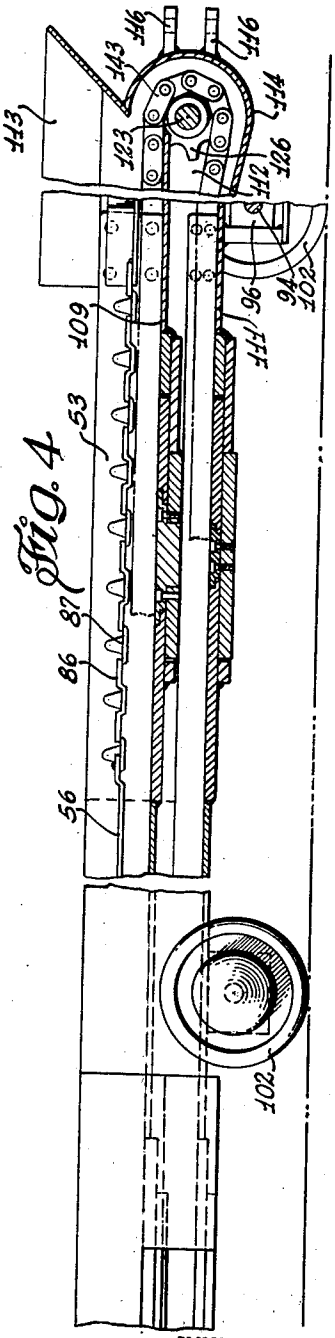


Fig. 4

INVENTOR.
Frank Cartlidge
BY Murray A. Gleason
ATTORNEY

April 6, 1954 F. CARTLIDGE 2,674,364

PORTABLE CONVEYING APPARATUS

Filed Dec. 30, 1950

6 Sheets-Sheet 3

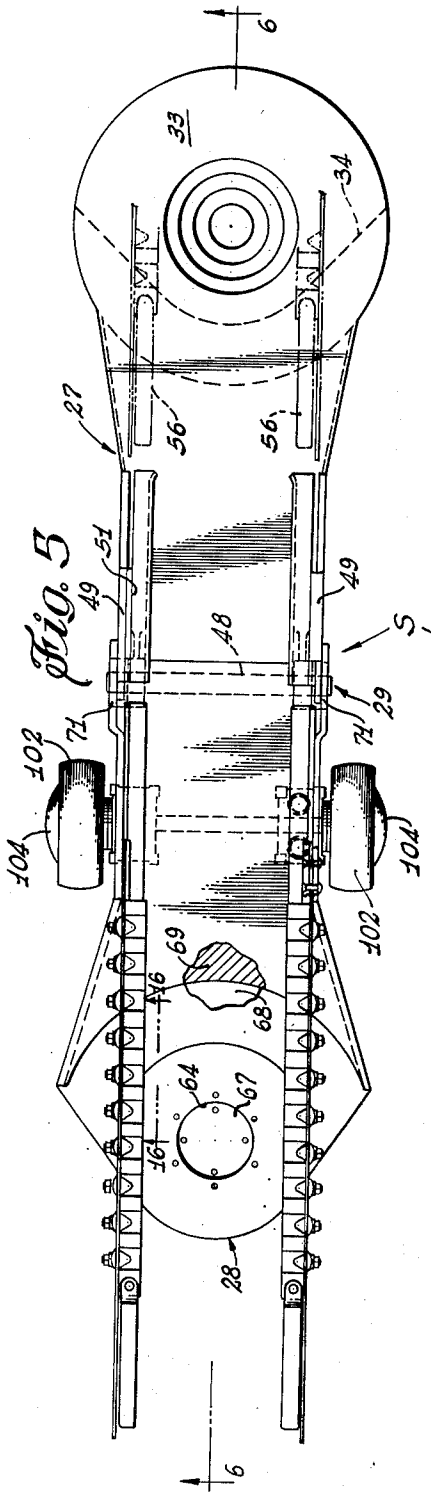


Fig. 5

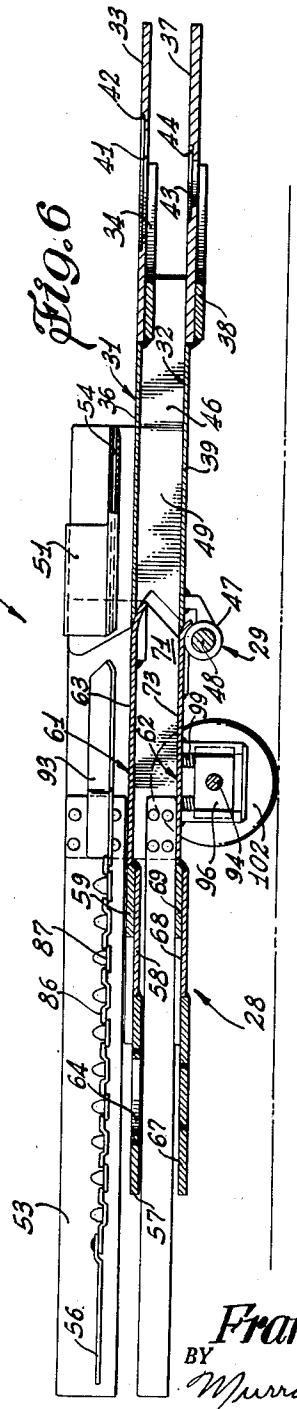


Fig. 6

INVENTOR.
Frank Cartlidge
BY
Murray A. Gleeson
ATTORNEY

April 6, 1954 F. CARTLIDGE 2,674,364

PORTABLE CONVEYING APPARATUS

Filed Dec. 30, 1950 6 Sheets-Sheet 4

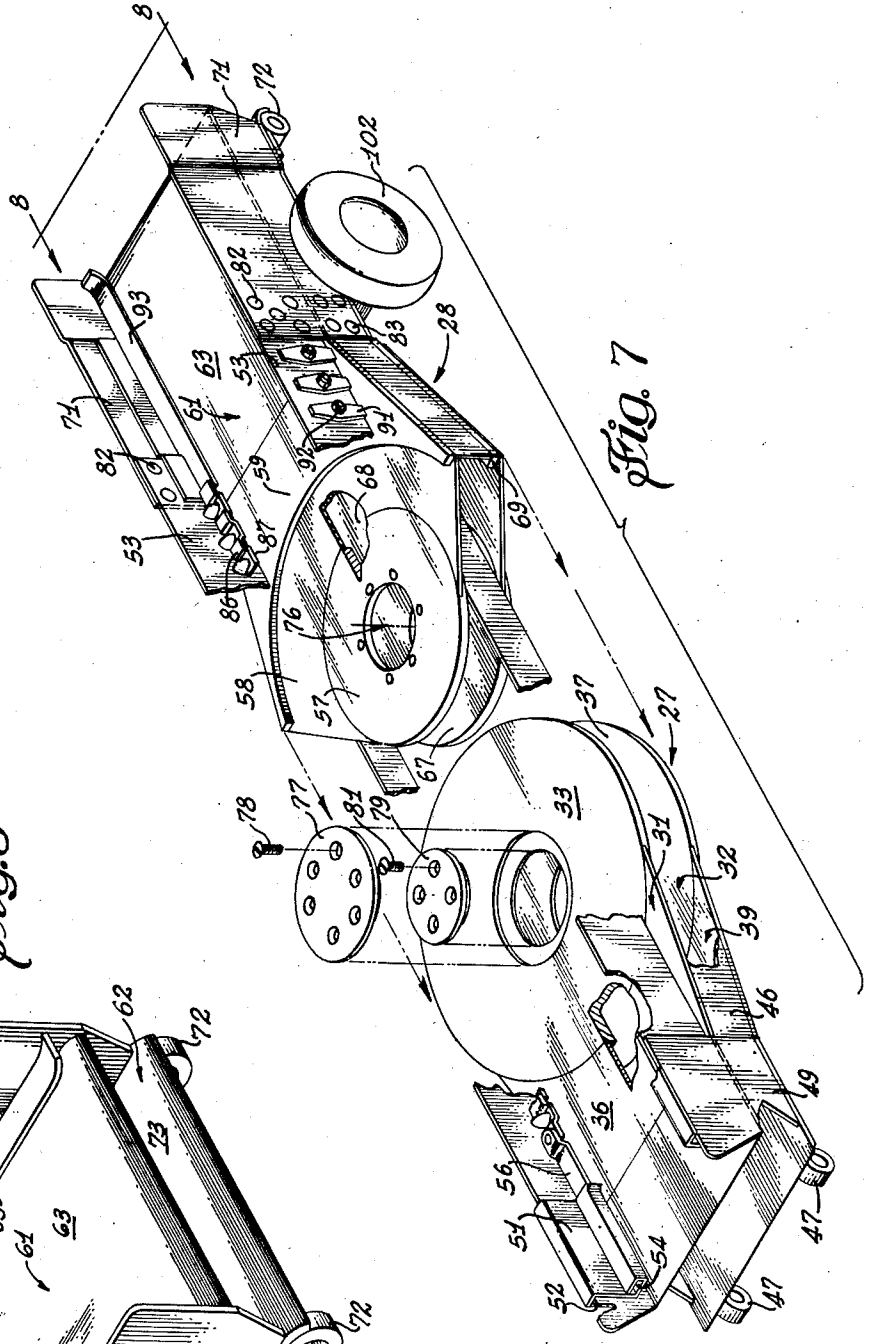


Fig. 7

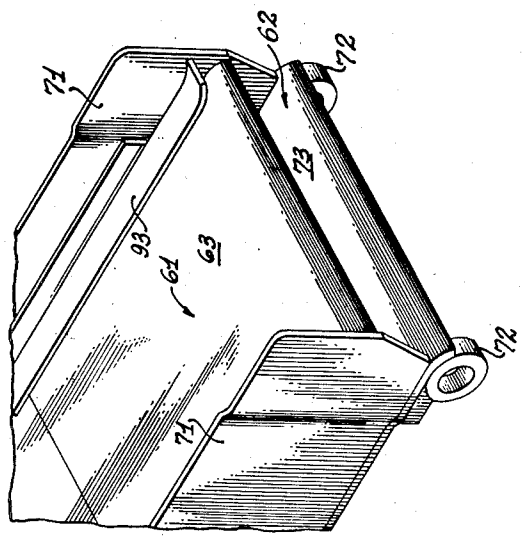


Fig. 8

INVENTOR.
Frank Cartlidge
BY Murray A. Gleason
ATTORNEY

April 6, 1954

F. CARTLIDGE

2,674,364

PORTABLE CONVEYING APPARATUS

Filed Dec. 30, 1950

6 Sheets-Sheet 5

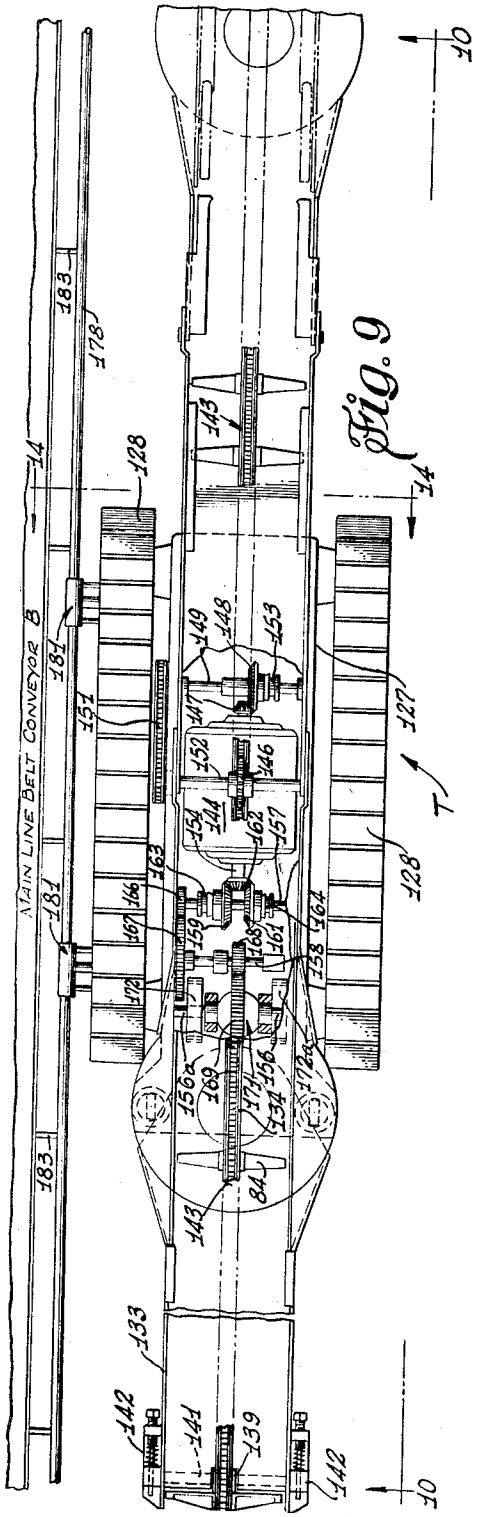


Fig. 9

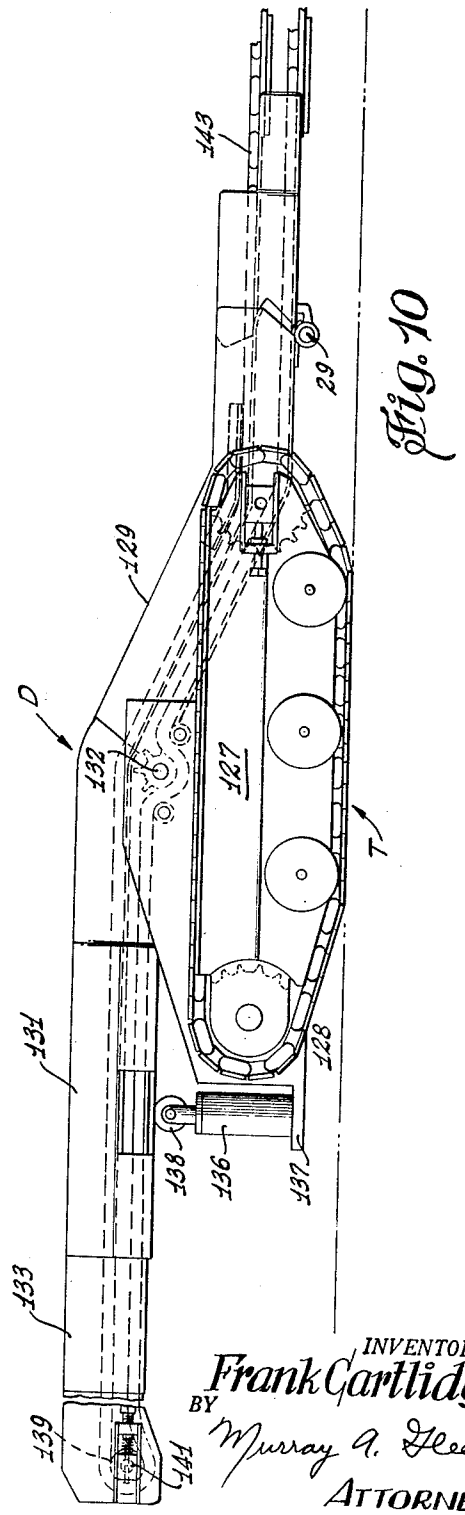


Fig. 10

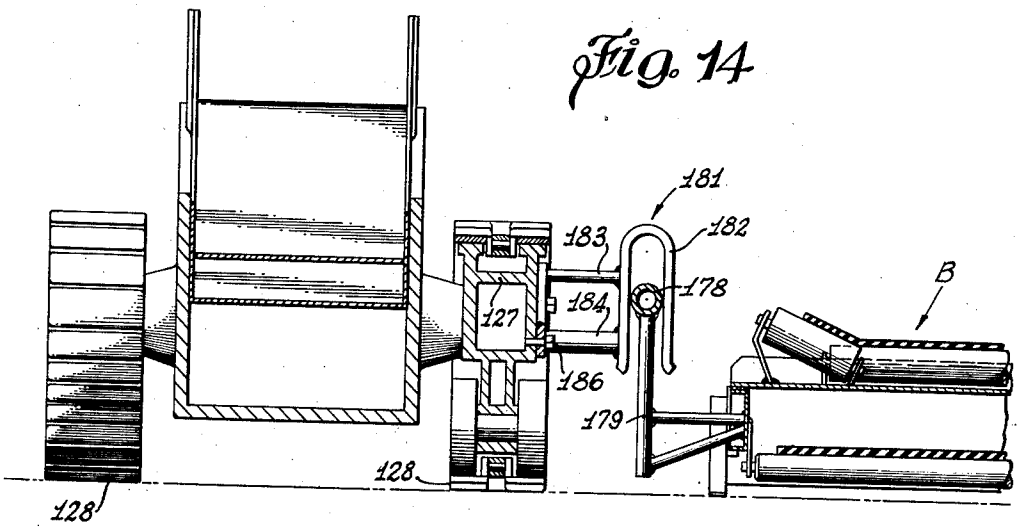
INVENTOR.
Frank Cartlidge
BY
Murray A. Gleeson
ATTORNEY

April 6, 1954 F. CARTLIDGE 2,674,364

PORTABLE CONVEYING APPARATUS

Filed Dec. 30, 1950 6 Sheets-Sheet 6

Fig. 14



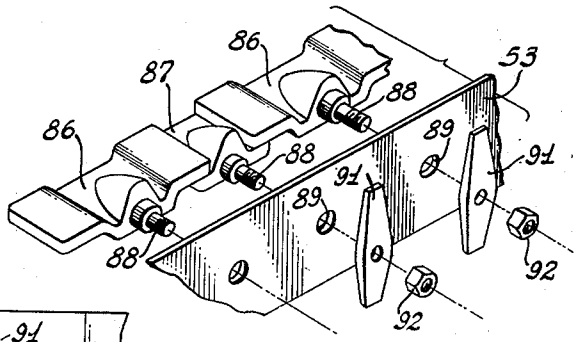


Fig. 15

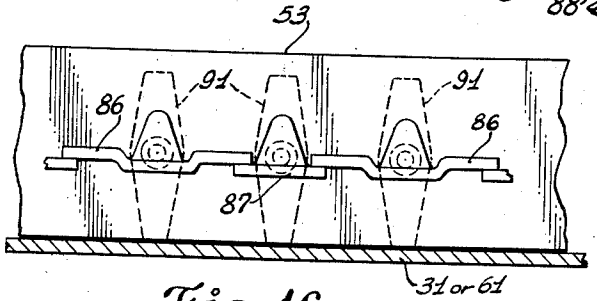


Fig. 16

INVENTOR.
Frank Cartlidge
BY
Murray A. Gleeson
ATTORNEY

Patented Apr. 6, 1954

2,674,364

UNITED STATES PATENT OFFICE

2,674,364

PORTABLE CONVEYING APPARATUS

Frank Cartlidge, Chicago, Ill., assignor to Goodman Manufacturing Company, Chicago, Ill., a corporation of Illinois

Application December 30, 1950, Serial No. 203,676

9 Claims. (Cl. 198—96)

1

This application is a continuation-in-part of applicant's prior application, Serial No. 137,404 filed January 7, 1950, and now abandoned.

This invention relates generally to mining and primarily to portable conveying apparatus which may be used to follow a continuous mining machine or mechanical loading machine into a room and continuously convey the mined material out and discharge it directly onto a receiver, such as a main belt running through an adjacent entry.

Present day mining and loading machines are capable of loading out coal or other mined material at a substantially continuous rate as they advance into a room being mined. Prior to the present invention, however, there has been no satisfactory means for continuously carrying the material away. Available means have included shaker conveyors which could be extended by adding sections to follow the machine; and shuttle cars running back and forth between the machine and the discharge point.

Shaker conveyors are not entirely satisfactory because of the fact that considerable labor is required in adding extension sections and in moving the entire assembly from one room to another and also the fact that while adding a section the loading machine must be shut down.

Shuttle cars are not entirely satisfactory, either, for the reason that the machine must be shut down while an empty car takes the place of a full one.

Thus, the conventional methods of taking mined material away from the face do not permit mining machines to operate continuously, thereby preventing the full potential production of these machines from being realized.

Accordingly, a principal object of the present invention is the provision of portable conveying apparatus which can continuously handle the production of a mining or loading machine.

Briefly, the invention comprises a series of pivotally interconnected sections having endless conveyor means operable therealong, the conveyor means being suitably flexible to function even when certain of the sections are out of alignment, as for example when the series is disposed around a corner or over an uneven floor. At the front end is a receiving section having coupling means which may be connected from time to time to the loading or mining machine so the series may be pulled by the machine into the room, as the latter is mined out. At the rear end of the series assembly is a discharge trough which is adapted to overhang and discharge material onto a main conveyor running through an adjacent entry; it is supported on a traction unit, in this case endless-tread-mounted, which is power operated for pulling the series of sections out of the room when mining therein has been completed. The traction unit has a guide adapted to engage a rail running along the main conveyor to maintain the discharge end of the portable conveyor in proper discharging relation therewith as the series is pulled into the room behind the loading machine. The traction unit is also provided, in its drive, with means for permitting the unit to free-wheel or "coast" as the series is pulled into the room.

2

Other objects and advantages of the invention will be apparent from the following description taken in connection with the drawings in which:

Figure 1 is a plan view of one embodiment of the novel conveying apparatus shown as it may be employed to continuously convey material to a main line conveyor from a mining machine;

Fig. 2 is a fragmentary enlarged side view of the receiving end of the portable conveying apparatus, as seen in the direction of the arrows 2—2 in Fig. 1, showing one arrangement for coupling to the rear end of the mining machine for advancing the series into the room;

Fig. 3 is an enlarged plan view of the receiving end of the portable conveying apparatus shown in Fig. 2;

Fig. 4 is a fragmentary longitudinal, partly-sectional view of Fig. 3 taken along the line 4—4;

Fig. 5 is a plan view of an individual section of the portable conveying apparatus;

Fig. 6 is a longitudinal side view, in section, of Fig. 5 taken along the line 6—6;

Fig. 7 is an exploded perspective view showing a horizontally swingable joint between connecting portions of two adjacent sections;

Fig. 8 is a fragmentary perspective view of Fig. 7 taken substantially in the direction of the arrows 8—8;

Fig. 9 is a fragmentary enlarged plan view of Fig. 1 showing the traction or power unit near the discharge end of the portable conveying apparatus, certain portions being cut away to show details;

Fig. 10 is a fragmentary enlarged side view of the traction unit as seen in the direction of arrows 10—10 in Figs. 1 and 9;

Fig. 11 is a transverse sectional view of Fig. 3 taken on line 11—11;

Fig. 12 is a transverse sectional view of Fig. 1 taken along the line 12—12;

Fig. 13 is a fragmentary sectional plan view

of a wheel mounting as seen along line 13—13 of Fig. 12;

Fig. 14 is a transverse sectional view of Fig. 9 taken along the line 14—14;

Fig. 15 is a fragmentary perspective view showing certain of the conveyor flight hold-down elements which are shown in lesser detail in Figs. 3, 4, 5, 6 and 7; and

Fig. 16 is another view of the hold-down elements as seen, for example, along the line 16—16 of Fig. 5.

Referring now more particularly to the drawings, the novel portable conveying apparatus is generally designated C and is illustrated in Fig. 1 as it would be employed with a cutting and loading machine M as the latter mines out a room X while continuously conveying coal or the like away and discharging it onto a receiver such as a main line conveyor B running through an entry E adjoining the room.

The machine M, as illustrated, may be a cutting and loading machine of the type disclosed in Cartlidge Patent No. 2,287,230 which continuously cuts out coal directly from the solid. The cutting head 21 is pivoted to swing up and down and from side to side as the machine is advanced into the mine face. A conveyor chain 22 carries the coal back from the cutting head of a loading boom 23 which is likewise universally pivotal to discharge the mined coal onto the portable conveying apparatus C. Since the machine M forms no part of the present invention, reference should be made to the above-mentioned patent for any further desired description of it.

The main conveyor B may be of any suitable type, as for instance a conventional endless belt which carries the mined material toward the mine portal.

Directing attention now to the novel conveying apparatus C, itself, it comprises: (*a*) a series assembly of pivotally interconnected sections S, (*b*) a forward receiving section R and (*c*) a rear discharge section D carried on a traction unit T. The receiving section R has suitable coupling means, as indicated at 24 in Fig. 2, for coupling, at times, to the rear end of loading machine M to permit the series of sections to be advanced into the room by tractive pull exerted by the machine itself. Conveyor means 26 operate along the sections R, S and D to carry the mined material and discharge it onto the main belt B. The power operated traction means T may be operated to pull the series of sections out of the room when mining therein has been completed.

An individual one of the sections S is best described in connection with Figs. 5, 6, 7, 8, 15 and 16.

Each section S is made up of a half section 27 and another half section 28 which are hinged together for up and down flexibility about a horizontal axis at a joint generally designated 29.

Each half section 27, as best shown in Fig. 7, is fabricated with an upper plate 31 and a lower plate 32.

Plate 31 supports the upper run of the flexible conveyor chain 26 and comprises an annular piece 33 with a reinforcing U-shaped piece 34 beneath it, both pieces being assembled by welding to a main piece 36. The lower plate 32 is fabricated in the same manner from pieces 37, 38 and 39, respectively. The piece 33 is formed with a bore 41 and a counterbore 42; likewise the piece 37 is formed with a bore 43 and a counter-bore 44. The upper and lower plates 31 and 32 are maintained in a fixed vertical spacing by means of side walls 46 which are welded along the edges of the pieces 36 and 39. At the bottom of each half section 27, and welded to the end of plate 32, is a pair of pintle-receiving members 47 which receive the hinge pintle 48 for the joint 29 as will be described.

Along each side, adjacent the joint 29, each half section 27 is provided with an upstanding wall 49 which further serves to tie the upper and lower plates 31 and 32 rigidly together. In addition, each wall 49 has an inwardly spaced vertical wall 51 which defines a space 52 for telescopically guiding the end of a flexible side plate 53 mounted on an adjacent half section 28; each member 49 is further formed to define a longitudinally extending recess 54 for telescopically guiding a hold-down tongue 56 carried by a corresponding one of the flexible side plates 53.

As shown in Fig. 7, each half section 28 comprises an upper plate 61 and a lower plate 62 for supporting the upper and lower runs of the conveyor 26, respectively. The upper plate 61 is formed by welding a relatively thick annular piece 57 to a relatively thin flared piece 58, the latter in turn being welded to the underside of an arcuately extending flared piece 59 which itself is welded on the end of a rectangular piece 63. The lower plate 62 is similarly made up from pieces 67, 68, 69 and 73, respectively. The plate 57 is provided with a bore 64.

The plates 61 and 62 are maintained in a fixed vertical spacing by means of side walls 66 welded in place across the flaring edges of parts 59 and 69. In addition, upstanding walls 71 are provided on each side of the rectangular pieces 63 and 73. At the end of each half section 28, and affixed to the underside of piece 73, is a pair of pintle-receiving members 72 which engage the above-mentioned pintle 48 to comprise the hinged joint 29.

It will be observed (Fig. 5) that the ends of upstanding walls 71 are flared outwardly sufficiently to permit the ends of walls 49 to work within them as the half sections are flexed up and down about the joint 29. To further accommodate this action, it will also be observed that the mating end surfaces of pieces 63—36 and 73—39 are formed on arcs struck from the center of the pintle 48.

The sections S are pivotal relative to one another about vertical axes by the arrangement shown in Fig. 7. For convenient reference each of these joints is designated 76. To assemble a joint 76, half sections 27 and 28 are lapped with bore 64 vertically aligned with bores 41 and 43. The cross-sectional details of a joint 76 are shown in Fig. 11 where it will be seen that an upper trunnion 77, connected to piece 57 by means of screws 78, is mounted within a bore 64 and a corresponding bore 41. In somewhat similar fashion, a trunnion 79, fixed by screws 81, is mounted on lower plate 62 and in a bore 43.

By this arrangement the individual sections S may be pivotally interconnected, yet providing an unrestricted traveling space along the successive lower plates 32 and 62 for the lower run of the chain conveyor and providing an unrestricted traveling space along the upper plates 31 and 61 for the upper run.

To provide for guiding the flexible chain about a joint 76, flexible side plates 53 are attached to the upstanding walls 71, as by means of rivets 82. The side plates 53 extend forwardly beyond the corresponding joint 76 and extend within the

guide space 52 provided on the adjacent half section. Similar flexible side plates, held in place by rivets 83, are provided to guide the lower run of the chain.

Provision should also be made for holding down the transverse flights 84 of the chain conveyor, particularly when successive joints 76 are turned in opposite directions so that the overall configuration of portions of the conveyor is the form of an S or Z shape. In the present case, as best shown in Figs. 15 and 16, this end is achieved by a series of lapping hold-down elements 86 and 87 having stud extensions 88 extending through holes 89 and washers 91 and held in place by means of nuts 92. These hold-down elements are positioned to define a freeway between themselves and the upper plates 31 and 61. One end of each series of hold-down elements is provided with an elongated tongue 56 which fits telescopically within the guide groove 54, previously described and works in and out within guide groove 54 as the sections turn about the joints 76. Additional hold-down guides 93 (Figs. 7 and 8), fixed to the interior of walls 71, complete the hold-down structure to prevent the flights 84 from tilting upward, out of contact with the material it is conveying. Similar hold-down means is normally not required for the lower flight because it is retained anyway between the upper and lower plates 31—32 and 61—62 and, furthermore, it is not conveying material so it is not essential that it be held down against the surface it is riding over.

As best shown in Figs. 11, 12 and 13, the series of conveyor sections S is resiliently supported on a spring-mounted wheel structure carried by each half section 28. As shown, a transverse, non-rotatable axle 94 is mounted in spaced blocks 96 each of which is formed with corner cut-outs to receive slideways 97. Each block 96 has two recesses 98 for a compression spring 99 each of which is compressibly interposed between the bottom of its recess and the under portion 73 of the conveyor. As shown in Fig. 11, each of the vertical sliding surfaces 101 of the blocks 96 is arcuately formed to permit the axle to tilt, without binding, to accommodate itself to uneven floor surfaces. As shown in Fig. 13, a wheel 102, which may be made of material such as steel or iron, is journaled on a bearing 103 which in turn is carried on an end of the axle 94, this assembly being held in place by a washer 106 and a nut 107. A concavo-convex hub cover 108 is carried on the wheel by means of studs 109.

As best shown in Figs. 2, 3 and 4, the receiving section R is pivotally connected to the adjacent section S by a joint similar to those already designated 76. The receiving section R comprises an upper plate 109 and a lower plate 111 suitably spaced apart by upright side plates 112 and having an outwardly flared peripheral hopper portion 113 extending along the sides and the end thereof. A cylindrical-shaped end wall 114 which functions as an upward extension of the lower plate 111, carries a pair of vertically spaced apertured ears 116 for receiving vertical pin 117 which holds clevis 118 in place. As shown in Fig. 2, a similar structure is carried at the rear end of the machine M and includes a pair of vertically spaced ears 119 and pin 121 which holds clevis 122 in place. The previously-mentioned coupling 24 connects clevises 118—122. The ends of the coupling are pivotable, about horizontal axes, with respect to the clevises in order to provide for up and down adjustability between the machine M and the receiving section R. It will be noted that, in order to stabilize the latter, it is provided with two sets of wheels which may be similar to the wheels 102 already described, and are so indicated in Fig. 2.

The receiving section R, as best shown in Fig. 3, is provided with a transverse shaft 123 rotatably journaled in bearings 124 and carrying a centrally located idler sprocket 126. The latter acts as a return for the flexible conveyor chain to be described.

Referring to Figs. 9 and 10, the power operated traction means, generally designated T, comprises a frame 127 mounted on endless treads 128 and includes self-contained power means for driving both the treads and the conveyor chain above-mentioned. The discharge section D, which is mounted on the frame 127, is constructed generally along the lines of the previously described sections S except that it is formed with an inclined portion 129 connecting, by means of a joint 29, to the nearest section S. The discharge section has a rear boom 131 pivoted for up and down movement about an axis indicated at 132. The boom 131 has an extension 133 pivoted for swinging movement about a vertical axis indicated 134. Piston and cylinder means 136 mounted on an extension 137 on the frame 127 and having roller means 138 engaging the underside of the boom 131 is effective to raise the latter when suitably controlled and operated by means not shown. The extension 133 may be suitably swung from side to side by any conventional means (not shown) or may be simply swung by hand if desired. The end of the extension 133 is provided with a return sprocket 139 mounted on a rotatable shaft 141 and spring loaded chain tensioning means 142 is provided to urge the shaft 141 backward to maintain the chain under tension at all times.

Further details of the discharge section D will be omitted as unnecessary here since that may take the form of those commonly used on loading machines.

Extending between the discharge end of sprocket 139 and the receiving end sprocket 126 and across the sections S is a conventional flexible center strand conveyor 143 carrying the transverse flights 84 above-mentioned.

Referring now more in detail to the mechanism employed for driving the treads 128 and the conveyor 143, the primary power means comprises the motor 144 which drives the conveyor chain drive sprocket 146 through beveled gear 148, shaft 149, chain 151 and shaft 152. The application of power to the conveyor 143 is controlled by suitable means (not shown) through a clutch 153. At its opposite end the motor shaft 154 is connected to selectively drive the traction drive shafts 156 and 156a by the following means:

Transversely mounted in the frame 127 are shafts 157 and 158. A pair of beveled gears 159 and 161, both in mesh with the beveled motor pinion 162, are carried by the shaft 157 and are rotatable with respect to it except when connected by means of clutches 163 and 164, respectively.

Clutches 163 and 164, controlled by means not shown, are splined to shaft 157 and are selectively engageable within the hubs of gears 159 and 161, respectively, to rotate shaft 157 one way or the other. A spur pinion 166, carried by the shaft 157, drives spur gear 167 and shaft 158. The latter rotates spur pinion 168 which in turn rotates ring gear 169 of differential 171. Thus

wheel drive shafts 156 and 156a are selectively operable together or singly, depending on whether neither or one of brake means 172 or 172a is applied (by control means not shown). Details of a similar tread and conveyor chain drive are amply set forth in Patent No. 2,237,230, granted June 23, 1942, to Frank Cartlidge, and reference may be made to it for any further information desired.

Thus to propel the traction unit T in one direction, only clutch 163 is engaged; to reverse it, only clutch 164 is engaged; to steer, one of the treads is selectively braked by means 172 or 172a, while driving power is applied to the other through the train just described.

To guide the series about a corner, as for example a corner at the juncture between the room X and the entry E, indicated 173 in Figs. 1 and 12, an arcuate guide rail 174 is provided, being held firmly in place by jacks 176 braced between the roof and floor and to which the rail may be attached as by end brackets 177. The rail 174 may be located at a height suitable for engagement by the outer, convex surfaces of the wheel covers 104. As best shown in Figs. 9 and 14, means is provided for guiding the traction unit T in a path of movement which is parallel to the main line belt conveyor B especially while the machine M is pulling the series into the room X. In the present case this means comprises a guide rail 178 extending along the side of the main belt B and carried by brackets 179 affixed to the belt frame. A pair of rail engaging guide members 181 is carried by the traction frame and each comprises an inverted U-shaped strap 182 mounted on brackets 183 and 184 which in turn are mounted on the traction frame 127 by any suitable means such as bolts 186. Thus, as the machine M pulls the series into the room, around the guide rail 174, the traction unit is maintained in a fixed path alongside the main belt conveyor. With this arrangement, it is necessary to fit the discharge extension 133 only once to a desired overhanging disposition (see Fig. 1) and this position will be maintained, discharging material directly onto the main belt over its entire range of movement therealong.

In use, before the room X is cut, the miner M and conveying apparatus C will first be disposed along the entry E parallel to the main line conveyor B, with the discharge boom extension 133 swung to its Fig. 1 position to overhang the main conveyor. The coupling 24 may be disconnected as the miner advances a few feet to begin cutting the room, and its unloading boom 23 will be swung to discharge material directly into the hopper 113. The clutch 153 in the traction unit T will be engaged to drive conveyor 143 to transfer the mined material onto the main conveyor. When the room is cut out sufficiently to define the corner 173, the guide rail 174 will be emplaced, following which the series of sections will hug the rail in making a turn. At the same time the guide straps 182 will grip the main belt rail 178 to keep the traction unit for drawing away from the belt as the series is pulled into the room. The miner will continue cutting out coal from the solid and will draw the series in behind it under its own tractive power as it advances. The conveyor apparatus C may remain coupled to the rear of the miner at all times, if desired, or it may be uncoupled while the miner is actually removing material from the mine face, and coupled to it only at intervals to draw it forward. To permit the series to follow, the treads 128 will be placed in free-wheeling condition by disengaging both driving clutches 163 and 164 and both brakes 172 and 172a. Thus the traction unit discharge boom 133 may be maintained in position to overhang the main conveyor while the entire room is being mined out. With a series assembly of suitable length the room may be mined in a substantially continuous operation, with material being taken directly from the solid and transferred to the main conveyor for removal to the surface without further handling. When the room is mined out to its maximum depth, the coupling 24 will be disconnected and power applied to the traction unit to draw the series back into the entry. The miner M will then be backed out and reconnected to pull the series along the entry to start a new room.

While a particular form of the present invention has been shown, it will be apparent that minor changes therein will readily suggest themselves to others skilled in the art without departing from the spirit and scope of the invention. Having thus described the invention, what is claimed as new is:

1. Portable conveying apparatus adapted to follow a loading machine comprising an articulated chain conveyor having receiving and discharge sections at opposite ends thereof; coupling means for connecting said receiving section to said loading machine for pulling the conveyor in one direction, at times, by tractive effort exerted by the loader; said discharge section having power operated tramming means associated therewith for pulling said conveyor in the opposite direction, at times, by tractive effort exerted thereby; an end portion of said discharge section being swingable to discharge into a main conveyor running alongside said discharge section; and guide means on said discharge section engageable with a rail running alongside said main conveyor to maintain said discharge section end portion in position to discharge onto said main conveyor as said receiving section is drawn forward by said loading machine.

2. Portable conveying apparatus adapted to follow a loader comprising a series of pivotally connected sections having at one end portion means for coupling to the loader for pulling the series in one direction by tractive effort exerted by the loader, hopper means at said one end portion for receiving material from said loader, conveyor means operating along said sections to carry said material from said hopper to the other end portion of the series for discharge, and power operated means at said other end portion effective at times to pull the apparatus in the opposite direction, said apparatus having at said other end portion, a discharge extension mounted for lateral swinging movement into position to overhang and discharge said material onto a main conveyor running alongside said other end portion, and a downwardly opening U-shaped guide associated with said other end portion for slidable association with said main line conveyor and effective to maintain a predetermined material discharge relationship between said extension and said main conveyor as the series is pulled into the room behind the loader.

3. Portable conveying apparatus adapted to follow a loading machine into a room as it is being mined out and to transfer mined material from said loading machine to a main conveyor running through an adjacent entry, comprising a series of articulated sections which are pivotally interconnected for adjustment about vertical and

horizontal axes and which have flexible conveyor means operable therealong, means carried by one of said sections for driving said conveyor means, coupling means at one end for connecting to the loading machine at times for movement of the entire series by pull exerted by the loading machine, and power operated traction means at the other end of the series for pulling the apparatus at times in the opposite direction, said apparatus adapted normally to operate with its receiving end portion extending into the room behind the loading machine and with its discharge end portion extending alongside the main conveyor in the entry, said discharge portion having a terminal extension movable to a transverse disposition overlapping said main conveyor to discharge material onto the latter while being pulled along the main conveyor by the loading machine, guide means adapted to be fixed with respect to the floor of the mine and engageable with said series to guide said apparatus about a corner as the series of sections is pulled between the room and entry, and additional guide means carried by said traction means and cooperable with a rail running alongside said main conveyor to maintain said traction means at a predetermined spacing relative to the main conveyor as the series follows the loading machine into the room.

4. Portable conveying apparatus movable to follow a loading machine into a room as it is being mined out and to transfer mined material from said loading machine to a main conveyor running through an entry comprising: a series of pivotally interconnected sections having conveyor means operable therealong; resilient wheeled supports at intervals along said series; means carried by said series for driving said conveyor means; and power operated traction means at the end of the series remote from the machine for pulling the series away from the machine; said series adapted normally to operate with its receiving end portion extending into the room behind the loading machine and with its discharge end portion extending alongside the main conveyor in the entry; said discharge portion having a terminal extension movable to a transverse disposition overlapping said main conveyor to discharge material onto the latter as said discharge end portion is moved along a line paralle to said main conveyor; means for disconnecting the power at times from said traction means to permit the latter to free-wheel as the loading machine pulls the series into the room; a guide rail extending along said main conveyor, and guide means carried by said traction means and opening toward the ground for slidable engagement with said rail along opposite sides thereof to constrain movement of the traction means to a path parallel to the main conveyor.

5. In a mobile conveying apparatus adapted to follow a loading machine into a mine room during the mining operation thereof and to transfer the mined material from the loading machine to a main conveyor extending along an adjacent entry, extending transversely of said room; an articulated conveyor assembly having a front section, coupling means selectively operable to connect said front section to the rear of the loading machine, to accommodate the loading machine to pull the assembly into the room and follow the same during the loading operation, said assembly having a rear discharge section laterally swingable into material discharge relationship with respect to the main conveyor, an endless conveyor extending along said assembly from the front to the rear sections thereof, a traction unit including traction devices supporting said rear section, a driving connection between said motor and said conveyor means including clutch means selectively operable to drive said conveyor means from said motor, a driving connection between said motor and said traction devices, including clutch means selectively operable to connect said driving connection to said traction devices and to disconnect said driving connection therefrom, to accommodate said traction unit to free-wheel and to be pulled alongside said main conveyor by the loading machine, and means maintaining said rear section in material discharge relation with respect to said main conveyor comprising a rail extending along the main conveyor and a guide member on said rear end section extending along opposite sides of said rail and having sliding engagement with said rail for maintaining the travel of said rear end section parallel to said main conveyor during movement therealong.

6. A portable conveying apparatus adapted to follow a loading machine into a room during the mining operation thereof and to transfer mined material from said loading machine to a main conveyor running through an entry at an angle to the room, comprising a series of wheel supported trough sections, means connecting said trough sections together at their adjacent ends for movement about transverse axes, each of said trough sections being movable about vertical axes disposed intermediate their ends, an articulated chain and flight conveyor movable along said trough sections, coupling means at the end of the series adjacent the loading machine for pulling the series into the room behind the machine when connected thereto, power operated traction means at the end of the series remote from the loading machine for pulling the series out of the room, said traction means also having means thereon for driving the conveyor, and the conveyor extending over said traction means and being movable into position to discharge into the main conveyor extending generally parallel to said traction means, a guide rail independent of said traction means and extending along the main conveyor in parallel relation with respect thereto, and a guide member carried by and spaced laterally from said traction means and extending along opposite sides of said rail and having slidable guiding engagement therewith, to maintain said discharge end portion of said conveyor in material discharge relation with respect to said main conveyor, as the series is pulled into the room.

7. Portable conveying apparatus adapted to follow a loading machine into a room as it is being mined out and to transfer mined material from said loading machine to a main conveyor running through an entry at an angle to the room, comprising a series assembly of transversely pivotally connected trough sections, each of which is articulated for movement about a vertical axis disposed intermediate its ends and is wheel supported adjacent said pivotal axis, and receiving and discharge end trough sections, a laterally flexible chain and flight conveyor movable along said trough sections from one end trough section to the other, coupling means at one end trough section for connecting the series assembly to a loading machine for movement of the entire series thereby, power means at the other end section, for driving said chain and flight conveyor, and said other end section extending laterally from said power

means into position to discharge onto the main conveyor, an arcuate guide adapted to be fixed about a corner at a juncture of the room and entry, means on said sections adjacent the pivot thereof and in vertical alignment with the axes of said wheels for engagement with said guide, to guide the series about a corner, a guide rail extending along the main conveyor, and a guide member extending laterally from said power means and having guiding engagement with opposite sides of the rail for maintaining said discharge end in material discharge relation with respect to the conveyor.

8. Portable conveying apparatus adapted to follow a loading machine into a room as it is being mined out and to transfer mined material from said loading machine to a main conveyor running through an entry, comprising a series assembly of transversely pivotally connected intermediate trough sections, each of which is articulated for movement about a vertical axis disposed intermediate its ends and is wheel supported adjacent said vertical axis, and receiving and discharge end trough sections, a laterally flexible chain and flight conveyor movable along said trough sections from one end thereof to the other, coupling means at the receiving end section for connecting the assembly of sections to the loading machine for movement of the entire series thereby, power operated traction means supporting the discharge end section, for pulling the series at times in the opposite direction, said traction means also having power means thereon for driving said conveyor, and said discharge end section extending over said traction means into material discharge relation with respect to the main conveyor extending along one side of said traction means, an arcuate guide adapted to be fixed about a corner at the juncture of the room and entry, means on said sections for engagement with said guide, to guide the series about a corner, a rail extending along the main line conveyor, and other guides extending from said traction means into position to engage opposite sides of said rail and maintain the discharge end section of the conveyor in material discharge relation with respect to the main conveyor.

9. Portable conveying apparatus adapted to follow a loading machine comprising an articulated chain conveyor having mobile receiving and discharge trough sections and a plurality of intermediate wheel mounted trough sections pivotally connected together, coupling means for connecting said receiving section to said loading machine for pulling the conveyor in one direction, at times, by tractive effort exerted by the loader, said discharge section having power operated tramming means associated therewith for pulling said conveyor in the opposite direction, at times, by tractive effort exerted thereby, an end portion of said discharge section extending into discharge relation with respect to a main conveyor running alongside of said discharge section, and guide means on said discharge section opening toward the ground for engagement with opposite sides of a rail running alongside of said main conveyor, to maintain said discharge section in discharge relation with respect to said main conveyor as said receiving section is drawn forward by said loading machine.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,426,271	Bandura	Aug. 15, 1922
1,920,500	Garcia	Aug. 1, 1933
1,932,897	Jaggard	Oct. 31, 1933
1,933,655	Brooks	Nov. 7, 1933
2,250,933	Manierre	July 29, 1941
2,285,558	Bisset	June 9, 1942
2,305,009	Jarrett	Dec. 15, 1942
2,305,393	Smith	Dec. 15, 1942
2,388,385	Cartlidge	Nov. 6, 1945
2,420,009	Osgood	May 6, 1947
2,538,144	Carretto	Jan. 16, 1951
2,607,472	Senstock	Aug. 19, 1952

FOREIGN PATENTS

Number	Country	Date
494,103	Germany	Mar. 19, 1930
554,384	Germany	July 11, 1932
488,041	Great Britain	June 30, 1938
611,784	Great Britian	Nov. 3, 1948